

Potential Internship Projects – Office of Infectious Disease Services

Internships may be during the summer or other times of year. Funding may or may not be available. Many of the projects may require the intern to be in the office (in Phoenix) for much of the project.

This document is divided by the Program within the Office of Infectious Disease Services.

Infectious Disease Surveillance and Preparedness Program (starts on page 1)

Infectious Disease Epidemiology and Investigations Program (starts on page 2)

Infectious Disease Surveillance and Preparedness Program (contact Laura Erhart erhartl@azdhs.gov 602-364-3674)

Pediatric influenza morbidity and vaccine rates

Recommendations for influenza vaccine for children have changed greatly in the last decade, ranging from recommendations only for children with certain chronic health conditions (pre-2003) to all children (2008). In Arizona, influenza has been laboratory reportable since October 2004. Arizona is also planning to promote pediatric flu vaccinations this year. The intern will use data from Arizona's immunization registry (ASIIS) and the lab data to analyze: a) flu immunization coverage among children from 1998 to the present; b) pediatric flu incidence rates of reported cases from 2004 to the present; c) the proportion of pediatric cases in a given season compared to adult cases; and d) try to draw any conclusions about both the impact of the changing recommendations on flu vaccine coverage, and the impact of flu coverage on disease. This project may be publishable. This project can be done partly off-site, once data are de-identified.

Influenza-associated mortality analysis

Vital Statistics offices maintain death certificates, including on the category of “pneumonia and influenza”. With the advent of electronic death registries, these data may be available in a timely enough fashion to be useful for seasonal influenza surveillance. The intern will establish methods to pull the data, conduct a descriptive analysis of influenza-related mortality, and help define procedures for weekly analysis and use of data throughout the influenza season. The intern will also apply the “122-Cities” methodology to Arizona data, in order to establish thresholds for detecting an unusual number of deaths in a given week. The intern will need to be in the Phoenix office for much of this project. This project requires strong data analysis skills and the use of SAS. The outcome of the project will be used routinely by Department staff and incorporate into the weekly surveillance reported posted on the website, but may or may not be publishable.

Reporting and timeliness surveillance assessment

For the past three years, county health departments have completed an annual "reporting and timeliness assessment" as one component of the preparedness grant that examines countywide surveillance and investigations for communicable disease. ADHS then takes these reports and analyzes them to produce a statewide summary, weighted and unweighted by county size. The intern will help compile the 2008 report, can add more statewide factors by analyzing the statewide surveillance database, and will describe trends by comparing the three years of reports. This project can be done largely off-site, with regular meetings with the internship mentor. The project is relatively short but may also be supplemented with other preparedness epidemiology projects if this project alone does not constitute a full-length internship.

Influenza and bacterial co-infections

Secondary bacterial infections are a common complication of influenza, and thus the influenza season may affect the incidence and seasonality of certain bacterial infections. The intern will use either the surveillance data reported from laboratories and providers to examine laboratory-

confirmed influenza and invasive methicillin-resistant *Staphylococcus aureus* or invasive *Streptococcus pneumoniae*, or the hospital discharge database to examine influenza diagnosis and a set of bacterial infections (invasive and non-invasive) to describe the relationship or impact on the bacterial infections. This project may be publishable. This project can be done partly off-site, once data are de-identified.

Hospitalized flu cases

The intern would cross-match of influenza labs reported to the Office of Infectious Disease Services and inpatient records in the hospital discharge database, followed by descriptive analysis of these lab-confirmed hospitalizations and an examination of obvious risk factors.

Infectious Disease Epidemiology and Investigations Program (contact Shoana Anderson anderssm@azdhs.gov; 602-364-3147)

Conduct a Population Survey with Questions Regarding Food Consumption Behaviors and GI Symptoms

The ability to rapidly interview controls is often critical in identifying the source of an outbreak; however, this process often requires a lot of staff time and can last for weeks, delaying the investigation. Students participating in this study will draft a questionnaire on recent grocery shopping and restaurant exposures, as well as information on geographical distribution and key demographic variables. Students will administer the questionnaire via telephone to randomly selected controls in the population to identify the frequency of restaurant and grocery store exposures in a non-ill population. Differences in demographics and geographical areas will also be explored.

Campylobacteriosis Study

Student will conduct enhanced surveillance activities for reported campylobacteriosis cases. This will include: drafting an enhanced surveillance form for campylobacteriosis based upon currently published information of trends and risk factors; conducting phone interviews with reported cases; and analyzing survey results. The enhanced surveillance form will examine in more depth topics introduced in the “long form” or in the literature, and will be conducted on a subset of reported cases in order to direct future investigations. May be publishable.

Full bibliography/literature search and position paper on Food handlers and *Salmonella*:

Student will conduct a literature review on the role of infected food handlers (both symptomatic and asymptomatic) as the source of *Salmonella* outbreaks. Currently, there is debate among experts regarding the role of asymptomatic food handlers in spreading *Salmonella*. We would like to answer the questions: How frequently are infected food handlers the source of an outbreak? And in this setting, are there specific activities or risk factors that resulted in spread? The student will be expected to summarize their findings in a paper which will be submitted to ADHS along with all reference articles. Depending on the findings this could lead to a meta-analysis on the role of food handlers in foodborne outbreaks.

Foodborne Stats and Webpage

Student will work with program manager and foodborne epidemiologist to generate monthly statistical reports on enteric diseases. Student will also be asked to help with webpage design for a foodborne disease site at azdhs.gov that will cover general stats on foodborne disease, current outbreak summaries, and resources for additional information on foodborne disease and investigating a foodborne outbreak.

Analysis of antibiotic resistance patterns

Collection and surveillance of antibiograms (antibiotic resistance/susceptibility patterns) from hospitals as a proxy to look at resistance trends, for selected organisms.

Physician survey of hepatitis B or pertussis testing practices

The pertussis and acute hepatitis B case definitions requires cases to have pertinent lab information and particular symptom profiles. However, we receive many positive test results that, upon further investigation, do not correlate to cases based on clinical case definitions. The intern would conduct a survey of physician testing practices for either of these diseases to identify the most common reasons for testing in order to inform practices for surveillance and investigations.

Foodborne or invasive disease surveillance data analyses

Using the data collected through routing surveillance, perform descriptive analyses of invasive diseases (*Streptococcus pneumoniae* infections; group A streptococcal infections) or foodborne illnesses (campylobacteriosis, *E. coli*, etc.). Analyses can include demographic information; timing of illness, testing, diagnosis; types of symptoms or infectious; or risk factors. Chart reviews may be an option if additional information needs to be collected for the project.

Correlation of reported foodborne illness cases and environmental health complaints

Examine reported cases of foodborne illness in conjunction with complaints received about food service or other facilities through the environmental health complaint line.

Evaluation/quality of outbreak investigations and identification of key decision points

The quality of outbreak investigations varies considerably, often dependent upon the time to detection and key decision points. Besides the obvious outcome measures, what are the attributes of a quality outbreak investigation and how can they be measured? What are the key decision points during an outbreak investigation?